

## **REMARKS**

### **I. Present Status of the Application**

The Office Action has rejected claims 8-15 under 35 U.S.C. 103(a) as being unpatentable over Braeuer et al. (US 5,164,063, referred to hereinafter as "Braeuer") in view of Yokoyama (JP 62-089864, abstract, referred to hereinafter as "Yokoyama").

In response thereto, Applicant has amended independent claim 13 to describe the claimed invention more explicitly. It is believed that no new matter is added by way of the amendments made to the present application. After entry of the proposed amendments, Applicant respectfully traverses the prior art rejections and submits that the presently pending claims 8-15 are placed in proper condition for allowance. The reasons that motivate the above position of the Applicant are discussed in detail hereafter, upon which reconsideration of the application and claims is most earnestly requested.

### **II. Discussion of Claim Rejections under 35 U.S.C. 103**

*Claims 8-15 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Braeuer in view of Yokoyama.*

After carefully considering the remarks set forth in this Office Action and the cited reference, Applicant has amended independent claim 13 so as to more clearly define the physical vapor deposition process according to the present invention. The supporting ground for the amendments made to claim 13 can be found at least in FIGs. 6A-6B, FIGs. 8A-8B and the associated description in the specification without entering any new matter.

As such, Applicant respectfully submits that the present invention, as set forth in claims 8-15, is neither taught, suggested nor disclosed by Braeuer and Yokoyama, or any other cited references, taken alone or in combination, and hereby traverse these rejections as described in detail hereinafter.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be **some suggestion or motivation**, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be **a reasonable expectation of success**. Finally, the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. See MPEP § 2143. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicant respectfully submits that the Examiner has failed to establish the *prima facie* obviousness in rejecting independent claims 8 and 13 for at least the reasons that Braeuer and Yokoyama, taken alone or combined, fail to teach or suggest, among other things, a rotating magnetron device comprising “*two symmetrical magnets in two correspondingly symmetrical magnet sets have opposite orientations in magnetic pole and two adjacent magnets in each of said magnet sets have opposite orientations in magnetic pole*”, as substantially recited in claim 8 and 13. That is to say, two symmetrical

magnets respectively belonged to two dividing magnet sets have opposite orientations in magnetic pole. The present invention also teaches in claim 13, among other things, “... *starting said rotating magnetron device to perform a deposition process for forming an asymmetric film with a shift direction, and rotating said rotating magnetron device during said deposition process, wherein the shift direction of the asymmetric film rotates and is offset so as to form a symmetric film*”.

As shown in FIGs. 6A-6B in the instant application, it should be emphasized that the deposited thin film 600a on the sidewall of the opening 304 deflects toward a shift direction and becomes asymmetric thin film due to the magnetic field generated by the specific deployment of the magnets in the claimed invention (FIG. 6A), and then, the shift direction of the thin film rotates with the rotation of the rotating magnetron device so that the deposited thin film 600b on the sidewall of the opening 304 is symmetric to complete the deposition process (FIG. 6B). In other words, the present invention teaches the magnets symmetric to each other having opposite orientations, and thereby an asymmetric deposition of the thin film is carried out first. Since the shift direction of the asymmetric deposition rotates during the deposition process, the asymmetric deposition of the thin film on the sidewalls of the opening can be effectively compensated and thus to be symmetric.

Braeuer, on the other hand, teaches the polarity of the symmetric magnets 9 and 10 are both N poles, and the polarity of the symmetric magnets 9' and 10' are both S poles (FIG. 3; col. 3, lines 27-38). In addition, Yokoyama discloses all inner parts of the magnet pairs 23 are with the same polarity (i.e. S pole), and all peripherals of the magnet pairs 23

are with the same polarity (i.e. N pole), as shown in FIGs. 1A, 1B and 2. Accordingly, Braeuer and Yokoyama both fail to teach or suggest the feature regarding “two symmetrical magnets in two correspondingly symmetrical magnet sets have opposite orientations in magnetic pole”, as recited in claims 8 and 13.

Moreover, as shown in FIG. 4 in Braeuer reference, the section through the target 16 shows an absolutely symmetric erosion profile 34. Therefore, the magnet arrangement taught by Braeuer aims to form a symmetric ablation of the target and symmetric film deposition, rather than an asymmetric deposition and compensation during the rotation. Since the configuration of polarities in the magnet sets claimed in the present invention is quite different from that in Braeuer reference, the magnetic line of force and the magnetic field generated by the magnets in the claimed invention are totally distinct from that in the cited reference. Applicant respectfully contends that the symmetric erosion profile 34 in Braeuer’s teaching is carried out by the symmetric magnets with the same orientation, such that the purposes and effects of Braeuer reference and of the claimed invention are contrary. Thus, randomly interchanging the polarity of Braeuer’s magnet sets has basically destroyed the principle of Braeuer’s teaching.

Addressing to the combinations of polarities proposed by the Office, Applicant submits that neither Braeuer nor Yokoyama is reasonably pertinent to the particular intention with which the claimed invention is concerned, and the cited references do not disclose any motivation or suggestion for the symmetric magnets with opposite polarities. Accordingly, there is no teaching or suggestion anywhere that would lead one of ordinary skill in the art at the time the invention was made to modify the magnet sets taught by

Braeuer with other combinations of polarities, in the manner suggested only by the Examiner, which is only possible **with the benefit of hindsight reconstruction of the claimed invention based solely on Applicant's disclosure, not the cited references and not the knowledge of the prior art.**

In light of the foregoing, it is held that the two references combined do not teach or suggest each and every element in claims 8 and 13. Furthermore, these two prior art references do not establish any suggestion, teaching or motivation that would have led a person of ordinary skill in the art to try the combinations of polarities in the manner proposed by the Office. Thus, a *prima facie* case of obviousness for claims 8 and 13 has not been established by the Office.

In at least the aforementioned regards, it is submitted that the obviousness rejection based on the cited references is improper as the cited references fail to teach or suggest all aspects of claims 8 and 13 of the instant invention in such a manner as to perform as the claimed invention performs. Accordingly, people of ordinary skill in the art at the time the invention was made would not be able to arrive at the apparatus and the process claimed in the present invention by modifying Braeuer in view of Yokoyama. Thus, Applicant submits that independent claims 8 and 13 distinctly and patently define over the prior art references, and thus the rejections thereof should be rendered moot. Applicant further respectfully points out that if independent claims 8 and 13 are patentable over the prior art of record, claims 9-12 and 14-15, based on their dependence upon respective claims 8 and 13, are allowable as a matter of law, because these dependent claims contain all features of their base claims.

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Hence, favorable consideration of the present application and withdrawal of these rejections are respectfully solicited.



**CONCLUSION**

For at least the foregoing reasons, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

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